



Rochdale & Littleborough FRMS Phase 1B - Littleborough

Discharge of Condition 6: Construction Management Plan

TBC-VSL-00-ZZ-RP-W-0003 Rev A

May 2023

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Quality Assurance

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1.0 Introduction

1.1 Planning consent

1.1.1 On 14 July 2022 Rochdale Metropolitan Borough Council (RMBC) granted planning consent for Phase 1B of the Rochdale & Littleborough Flood Risk Management Scheme (FRMS) under planning reference 22/00485/FUL.

1.1.2 A number of planning conditions were attached to the consent, including condition 6 which reads:

No development shall take place until a Construction Management Plan (CMP) detailing techniques for the control of noise and vibration during demolition and construction has been submitted and to and approved in writing by the Local Planning Authority. These measures shall include the following requirements:

- *Confirmation that all best practice measures are undertaken as outlined in section 10.4 (mitigation) of the Environmental Statement;*
- *Vibration is monitored and a cut off limit is set at or around 8mm/s, a detailed plan will be developed should this level be breached;*
- *For all buildings likely to experience vibration over 10 mm/s alternative mitigation is to be implemented;*
- *For all buildings likely to experience vibration over 10 mm/s, enhanced vibration monitoring will be undertaken on an individual building basis;*
- *For all buildings likely to experience vibration over 10 mm/s, pre and post structural surveys are to be undertaken;*
- *For all receptors likely to experience noise levels from any of the planned activity, during daytime hours (07:00-19:00) that meets or exceeds 65 dB LAeqt and exceeds the measured baseline by +5dB, enhanced mitigation measures are to be detailed;*
- *For all receptors likely to experience noise levels from any of the planned activity, during evening hours (19:00-23:00) that meets or exceeds 55 dB LAeqt enhanced mitigation measures are to be detailed; and*
- *For all receptors likely to experience noise levels from any of the planned activity, during night time hours (23:00-07:00) that meets or exceeds 45 dB LAeqt enhanced mitigation measures are to be detailed.*

The construction management plan must contain the above measures, detailed hours of work specific to each work area and all other relevant matters. The demolition and construction phases shall thereafter be carried out in full accordance with the approved CMP.

Reason: In order to safeguard the amenities of the area and to prevent nuisance arising in accordance with Policies DM1 and G9 of the adopted Rochdale Core Strategy and the National Planning Policy Framework.

Reason for pre-commencement condition: To ensure the amenity of adjacent premises and users are protected prior to commencement of any works taking place.

1.1.3 This document is submitted in discharge of Condition 6 (Construction Management Plan).

2.0 Use of Best Practicable Means

2.1 Best practicable Means

2.1.1 The contractor shall assess, consider and implement Best Practicable Means (BPM) at all times in order to control noise and vibration during construction in all the sensitive areas adjacent to the works.

2.1.2 BPM is defined in Section 72 of the Control of Pollution Act 1974 and Section 79 of the Environmental Protection Act 1990 as those measures which are 'reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to financial implications'. These are required to be adopted on-site in order to reduce construction noise levels. Also, where practicable the control measures set out in BS 5228 will be implemented.

2.1.3 The following list details the relevant BPM, for managing noise and vibration that will be used on the site throughout the construction period:

- selecting low noise and vibration emitting plant/equipment where available and suitable;
- all equipment shall be maintained in good mechanical order and fitted with appropriate silencers, mufflers or acoustic covers;
- Starting up plant and equipment sequentially rather than all together;
- shutting down of equipment when not in use, i.e. implement an idling reduction plan;
- directing noise emissions from plant, including exhausts or engines, away from sensitive positions;
- starting up and turning off vibratory plant as far away from sensitive receptors as is reasonably practicable, to avoid excess vibration levels during start up and run down.
- Setting vibration soil compaction plant to low amplitude settings when operating in close proximity to sensitive receptors
- Keeping haul roads well maintained and avoiding steep gradients;
- careful selection of working methods and programme;
- all workers on site, including sub-contractors, self-employed staff and employees will be made aware of the need to keep noise and disruption to a minimum from building works, equipment, plant and machinery, radios, music, vehicles or any other sources;
- handling of all materials in a manner which minimises noise, including minimising drop heights into hoppers and lorries;
- the movement of vehicles to and from the site will be controlled to minimise noise and disturbance to nearby residents;
- switching all audible warning systems to the minimum setting required by the health and safety executive, and using banksmen as an alternative to audible alarms wherever practicable;
- monitoring of both noise and vibration throughout the works; and
- developing and maintaining good relations with people living and working in the vicinity of the works, including forewarning local residents of any potentially noisy or vibratory works including the periods the works would be undertaken within and explanation of why the works are required.

- Implementing an efficient pro-active communications procedure.

3.0 Roles and Responsibilities

3.1.1 The following roles and responsibilities are defined in respect to this CNVMP.

- **Construction Manager:** responsible for providing information on programme and timing of works, and issue to the Environmental Manager. To review the resources, work and working hours to reflect agreements reached with the Local Authority and then to provide additional information, should it be necessary for overruns, variations and night-time working, if any.
- **Environmental Manager:** responsible for the management and monitoring on site and for reporting the results to the site team, Environmental Health Officer (EHO) and Employer's Site Representative, as per required.

Community Liaison Manager: responsible for coordinating communications informing public of forthcoming works and receiving noise related comments or complaints from scheme neighbours and liaising with the site team to provide responses to the complainant, EHO and Employer's Representative. The project will issue regular news sheets explaining:

- Work that is taking place in the coming weeks;
- Works that have been undertaken; and
- Outcomes of complaints investigations.

3.1.2 Table 3.1 lists the roles and responsibilities with contact information for each of the above.

Table 3.1: Roles and responsibilities

Role	Name	Contact Details
Construction Project Manager	James Melody	E-Mail James.melody@volkerstevin.co.uk Mobile 07469 414 955
Environmental Manager	Linda Wilkinson	E-Mail Linda.Wilkinson@volkerstevin.co.uk Mobile 07384 871691
Community Liaison Manager	Jordanna Robinson	E-Mail Jordanna.Robinson@volkerstevin.co.uk Mobile 07384 234446

4.0 Working Hours

- 4.1.1 Full site working hours would be between 07.30 – 18.00 daily, Monday to Friday. Staff would arrive on site for daily briefings between 07.30am – 08.00am.
- 4.1.2 On-site working period for construction works and deliveries will be made during the following hours:



Figure 4.1 – On site working periods

- 4.1.3 The main construction activities would take place between the hours of 08.00 and 17.30. Should an occasion arise where there is a desire / need to deviate from these timescales at any point during the construction, a request will be made to the Local Authority to seek approval.
- 4.1.4 As part of procurement process, the terms will specify delivery times for supplier and subcontractor, and also specify waiting instructions. Should a vehicle which is unscheduled enter the site (outside timescales) the procurement department shall be contacted, and a non-conformance issued.
- 4.1.5 Sub-Contractors shall attend a prestart meeting which shall among other information highlight site hours and delivery terms (times deliveries are acceptable and delivery procedure).
- 4.1.6 The development will be carried out at several distinct locations around Littleborough. Table 4.1 below shows the works locations. The working hours identified will be applicable at each of these work locations. The work locations are shown on planning drawing IMNW000100-JAC-ZZ-4B0-DR-C-0103.

Table 4.1: Phase 1B Working Locations Overview

Gale Storage Reservoirs (East & West)	• Raised reservoir with earth embankments (Gale West and Gale East) with outflow controlled by an orifice structure. River Roch and Greenvale Brook diverted with infilling of former channels. • New maintenance access from Todmorden Road. • Partial permanent diversion of Public Rights of Way.
Reddyshore Brow	• Scour protection to bridge abutments • Linear defence.
Centre Vale	• Flood defence embankment along right bank.

Greenvale Business Park	Flood defence walls and embankments along both banks of river.
Grove Lodge	- Sheet piled flood defence wall alongside the railway (Potential for) minor permanent diversion of Public Right of Way.
Ealees Brook	New retaining wall/sheet piled wall approximately 50 M linear length.

4.1.7 Table 4.2 below sets out the proposed working hours at each of the work's locations, together with details of when noisy activities, or those that might generate vibration, will be carried out.

Table 4.2 – Working hours

Location	Normal working hours	Working hours – noisy activities	Working hours - activities generating vibration	Key noise and vibration generating activities
Gale West	07:30 AM – 17:30 PM	08:00AM – 18:00 PM	Piling would occur in increments throughout the duration of piling activity.	Piling – Railway Boundary Piling – Earthworks Piling – Structures Earthworks
Gale West	24-hour operation		N/A	River diversions and headwall dewatering activity will last for approximately 2-3 months. The main orifice structure will be for at least 6+ months.
Gale East	07:30 AM – 17:30 PM	08:00AM – 18:00 PM	Piling would occur in increments throughout the duration of piling activity.	Piling – Earthworks Piling – Structures Earthworks
Grove Lodge	07:30 AM – 17:30 PM	08:00AM – 18:00 PM	Piling would occur in increments throughout the duration of piling activity.	Piling – Railway Boundary Earthworks
Greenvale Business Park	07:30 AM – 17:30 PM	08:00AM – 18:00 PM	Piling would occur in increments throughout the duration of piling activity.	Piling – Flood Defence Wall Earthworks
Centre Vale	07:30 AM – 17:30 PM	08:00AM – 18:00 PM	Piling would occur in increments throughout the duration of piling activity.	Piling – Flood Defence Wall Earthworks
Ealees Brook	07:30 AM – 17:30 PM	08:00AM – 18:00 PM	Piling would occur in increments throughout the duration of piling activity.	Piling – Flood Defence Wall

5.0 Vibration

5.1 Vibratory activities

- 5.1.1 Vibratory sheet piling is potentially required for completion of the works in all areas of the scheme outlined in Table 4.1 with the exception of Reddyshore Brow, some in very close proximity to sensitive receptors. This has resulted in significant effects being predicted in the Environmental Statement (ES) (without considering any form of mitigation) due to vibration levels in exceedance of the recommended values. The piling activities are limited to the daytime only.
- 5.1.2 Vibratory compaction activity, associated with embankment construction is also proposed in locations such as Gale east and west and Centre Vale.
- 5.1.3 A PPV of 1 mm/s is the threshold at which vibration can result in disturbance and complaint and can occur at sensitive receptor locations within 55m of the piling works.
- 5.1.4 At locations where vibration levels are predicted above 1mm/s but below 10mm/s it is anticipated that through Best Practicable Means (see section 2.0) vibration levels can be sufficiently controlled.
- 5.1.5 However, at locations where vibration is predicted to reach intolerable levels of vibration above 10mm/s, the contractor shall select enhanced measures or other alternative measures which are suitable for implementing at the relevant sensitive locations in proximity to the piling works.
- 5.1.6 The locations predicted to exceed 1mm/s, 8mm/s and 10mm/s are summarised in Table A-1 in Appendix 2.

5.2 Vibration Monitoring locations

- 5.2.1 In order to allow for the control of vibration effects, vibration is required to be monitored continuously at representative worst-case locations during the activities likely to generate vibration.
- 5.2.2 The following monitoring locations have been proposed:
- Grove Lodge**
- 5.2.3 Vibratory piling activity in the form of sheet piled flood defence wall construction will occur alongside the railway.
- 5.2.4 There are five identified sensitive receptors at this location as identified in Table 5.1, including approximate distances from the works. These locations are also shown in Appendix 1A.

Table 5.1 - Grove Lodge vibration sensitive receptor locations

Area		Receptor Name	Activity
1	Grove Lodge	6 Rock Nook, 30m	Vibratory piling
2	Grove Lodge	22 Reddyshore Brow, 49m	Vibratory piling
3	Grove Lodge	Stansfield Hall C E & Free Church Primary School, Barnes Meadows, 77m	Vibratory piling
4	Grove Lodge	3 Green Clough, 109m	Vibratory piling

- 5.2.5 In order to monitor vibration two representative sample monitoring locations have been identified as shown in Appendix 1A.
- 5.2.6 The predicted vibration levels at these receptors are all below 8mm/s and are anticipated to be controlled through BPM measures identified in section 2.0. Should monitoring show

levels exceeding this then the steps and measures outlined in Section 2.0 would be followed.

5.3 Gale east

5.3.1 Vibratory compaction activity in this area from the construction of earth embankments will give rise to vibration effects.

5.3.2 One sensitive receptor has been identified and one monitoring location as shown in Appendix 1B.

Table 5.2 - Gale east vibration sensitive receptor locations

Area		Receptor name	Activity
5	Gale East	6 Pikehouse Cottages, Lightowlers Lane, 83m	Vibratory compaction

5.3.3 The predicted vibration level at this receptor is below 8mm/s and is anticipated to be controlled through BPM identified in section 2.0. Should monitoring show levels exceeding this then the steps and measures outlined in Section 2.0 would be followed.

5.4 Gale west

5.4.1 Vibratory piling and vibratory compaction activities will be undertaken in this location.

5.4.2 The sensitive receptor locations are identified in Table 5.3. Three monitoring locations have been selected and are shown in Appendix 1C. The representative receptors are affected by both vibratory compaction and vibratory piling activity.

Table 5.3 - Gale west vibration sensitive receptor locations

Area		Receptor name	Activity
6	Gale West	11 Shottwood Fold, 15m (East embankment)	Vibratory compaction
6	Gale West	11 Shottwood Fold, 15m (East embankment)	Vibratory piling
7	Gale West	8 Elim Street, 6.5m (West embankment)	Vibratory compaction
7	Gale West	8 Elim Street, 74m (cofferdam installation)	Vibratory piling
8	Gale West	6 Todmorden Road, 99m (South embankment)	Vibratory compaction
8	Gale West	6 Todmorden Road, 106m (south of spillway platform)	Vibratory piling

5.4.3 Receptors at Elim Street and Shottwood Fold are both anticipated to experience vibration levels in excess of 8mm/s and 10mm/s. Additional mitigation measures above BPM will be required for these areas as outlined in Section 2.0.

5.5 Greenvale Business Park and Centre Vale

5.5.1 Vibratory compaction and vibratory piling will occur in this location from the construction of embankments and sheet piled flood defence walls.

5.5.2 Table 5.4 shows the locations of sensitive receptors for this location.

Table 5.4 - Greenvale Business Park & Centre Vale vibration sensitive receptors

Area		Receptor Name	Activity
9	Greenvale Business Park	1 Moorland Street, 15m	Vibratory compaction
10	Greenvale Business Park	3 Centre Vale, 20m	Vibratory compaction
11	Greenvale Business Park	Unit 6B, Greenvale Business Park, 36m	Vibratory compaction
12	Greenvale Business Park	Unit 3, Greenvale Business Park, 14m	Vibratory piling
13	Greenvale Business Park	Jitterbugs Ltd, Riverside Works, Todmorden Road, 35m	Vibratory piling
14	Greenvale Business Park	1 Centre Vale, 75m	Vibratory piling

5.5.3 Four monitoring locations have been identified for this location. These are shown in Appendix 1D.

5.5.4 Receptors at Moorland Street and Unit 3 Greenvale Business Park are anticipated to experience vibration levels in excess of 8mm/s and 10mm/s.

5.6 Ealees Brook

5.6.1 Vibratory piling activity in this area is proposed. There are two construction methods proposed for the flood wall in this location, either sheet piling or masonry wall construction. Additional ground investigation works are planned to inform the selection of this construction approach.

5.6.2 There are the following representative sensitive receptors in this location that will be affected by piling activity should this go ahead.

Table 5.5 - Ealees Brook vibration sensitive receptors

Area		Receptor Name	Activity
15	Ealees Brook	Brookfield Garage, Canal Street, 1m	Vibratory piling
16	Ealees Brook	13 West Street, 6m	Vibratory piling
17	Ealees Brook	Red Lion Hotel, 6 Halifax Road, 14m	Vibratory piling
18	Ealees Brook	2 East Street, 27m	Vibratory piling
19	Ealees Brook	5 Church Street, 65m	Vibratory piling
20	Ealees Brook	1 Oak Street, 72m	Vibratory piling

5.6.3 Two monitoring locations are proposed for this area, as shown in Appendix 1E.

5.6.4 Receptors Brookfield garage, 13 West Street and the Red Lion Hotel are anticipated to experience vibration levels in excess of 8mm/s and 10mm/s.

5.7 Vibration monitoring equipment

- 5.7.1 Vibration monitoring should be undertaken following the guidance contained in BS 6472 on measurement of vibration for assessing human disturbance and for building damage in BS ISO 4866:2010.
- 5.7.2 Vibration monitoring should continuously measure the maximum PPV in mm/s in all the orthogonal directions over 1 to 30 second periods.
- 5.7.3 The most suitable location for vibration monitoring is on a hard surface, at ground floor level. For the assessment of risk of cosmetic damage, the meter shall be placed at the base of the building or near the foundation of the building to the outside. For assessment of human response (annoyance) the meter is best placed inside the building where the sensitive receptors are located. However, a measurement inside or outside the building should be suitable to compare with the established thresholds for each human annoyance and cosmetic damage. If access is not available inside of the most sensitive property, then an alternative representative location with access or to the outside of the property shall be sought.
- 5.7.4 The following vibration monitoring equipment will be used:



Examples of Monitex OD-AA Vibration Monitor on Site



Figure 5.1 - vibration monitoring equipment

5.8 Vibration Management trigger levels

- 5.8.1 The following sections outline the approach to vibration management. This will be based on the information from continuous vibration monitoring as outlined in Section 5.8.
- 5.8.2 A series of vibration trigger levels have been identified, which set out the levels at which different control measures are required as outlined in Table 5.6

Table 5.6 - Vibration activity trigger levels

Trigger Levels	Actions
Green Below vibration threshold of 1.0 mm/s	Continue works. Take note of works being undertaken at the time. Confirmation that nearby occupants have been notified of the works.
Amber 1	Continue works but raise alarm and evaluate/check affected receptor and consider next work location. Review BPM currently being used.

Trigger Levels	Actions
Between 1.0 to 8.0 mm/s	Notify of activities and mitigation measures to the affected occupants in accordance with the programmed activities ¹ .
Amber 2 Between 8.0 to 9.9 mm/s	Pause the works and review BPM currently being used, implement a plan for enhanced mitigation measures if not already in use. Start the works from the furthest point to the receptor and monitor the vibration levels as the works progress. When moving towards the receptor, consider additional mitigation to be identified before re-starting the works. Notify of activities and mitigation measures to the affected occupants in accordance with the programmed activities¹.
Red ≥ 10.0 mm/s	Stop works, review primary cause of trigger, and evaluate affected location. Implement enhanced mitigation measures identified at the previous stage. Schedule and undertake a structural survey. Implement property level monitoring. Evaluate additional mitigation measures required before re-starting the works. Convene design team meeting to agree ongoing plans and potential mitigation options. Considering modifying the methods / techniques of work. Notify of activities and mitigation measures to the affected occupants in accordance with the programmed activities ¹.
¹ The notification will describe the nature and duration of the works and any associated proposals for vibration monitoring.	

5.9 Vibration management up to 8mm/s

- 5.9.1 For most receptors, vibration effects can be controlled through effective communication with the local community to inform them of vibratory activity and potential anticipated durations and through the use of BPM outlined in Section 2.0.
- 5.9.2 The local community will be informed of construction activity by letter drops delivered to residents and updates will be made by social media on the local flood hub group.
- 5.9.3 Vibration monitoring information will be set to a suitable ppm/s levels and thresholds with the equipment suppliers in line with the trigger levels above.

5.10 Vibration management at or around 8mm/s

- 5.10.1 A cut of limit will be set at or around 8mm/s. The monitoring equipment will raise a notification/ alarm once vibration levels reach 8mm/s. At this stage works the following actions will be taken:
1. Review the current BPM in use and check that these measures are being followed.
 2. Review the enhanced mitigation measures outlined in BS 5228-2 and identify additional measures that could be used.
 3. Draft a plan for use of enhanced mitigation measures and detail which specific measures will be used
 4. Refine/ update the list of receptors that may exceed 10mm/a though additional vibration calculations taking into account BPM and enhanced mitigation measures identified.
 5. Plan and undertake pre-works structural surveys (in line with Section Table 5.6) for receptors anticipated to exceed 10mm/s, where required. Indicative locations where this may be required are outlined in Appendix 2.
 6. Notify and inform community and EHO of increasing vibration levels and provide details of the planned additional mitigation measures to be used.

7. Resume work from the furthest point to the receptor, where possible and continue to monitor vibration levels.

5.10.2 In line with Section 8 of BS 5228-2 enhanced mitigation measures in relation to the control of vibration arising from piling activities are as follows:

- Using 'variable moment and soft-start' piling techniques to reduce the vibration impacts generated by start-up and ramp down of the piling rig; A variable moment rig will be used for the use of the vibratory hammer. However, the impact hammer cannot be used on a variable moment therefore a soft start will be used for this element of piling.
- Wherever possible, the pile location will be pre-augured on each clutch to reduce resistance to the piling activity.
- VolkerStevin will consider using partial enclosures around hammer/driving systems;
- Careful alignment of pile and rig;
- Limiting durations of activities such that sensitive receptors are not exposed to prolonged periods of continuous vibration and are given respite periods.

5.10.3 The following enhanced mitigation measures shall therefore be considered by the contractor during the vibratory compaction works:

- Selection of plant with lowest maximum amplitude of vibration settings, appropriate to the task, when working in close proximity to receptors. Reducing the amplitude setting of the vibratory roller (i.e. using the lower setting or reducing the size of the plant), results in considerably lower levels of vibration and the radius of affected properties with a PPV level above 1.0mm/s can be reduced from 55m to 30m distance from the works.
- Selection of smaller plant (i.e. smaller number of vibrating drums and smaller drum size), appropriate to the task, when working in close proximity to receptors.
- Carrying out start-up and run-down of equipment as far as possible from receptors.
- Use of non-vibratory compaction techniques when working in close proximity of sensitive receptors, where practicable.
- Limiting durations of activities such that sensitive receptors are not exposed to prolonged periods of continuous noise or vibration and are given respite.

5.10.4 As identified it is anticipated that these levels will be experienced by receptors at Gale west (Shottwood Fold and Elim Street), Greenvale Business Park (Moorland Street and Unit 3) and Ealees Brook (assuming a sheet piled wall).

5.10.5 A detailed action plan would be developed and this would be communicated and shared with Rochdale Borough Council detailing the specific enhanced mitigation measures to be used.

5.11 Vibration management at 10mm/s

5.11.1 Once vibration monitoring shows that levels reach 10mm/s, the following steps will be taken:

1. Enhanced mitigation measures identified will be implemented
2. Implement property level vibration monitoring, indicative locations where this might be required are outlined in Appendix 2.
3. Consider and implement alternative construction methodologies (i.e. non-vibratory piling techniques)
4. Notify community and Rochdale Borough Council of vibration levels.

5.12 Vibration management – structural surveys

- 5.12.1 In some cases, the predicted vibration level arising from vibratory piling could lead to cosmetic building damage. The key risk areas are the potential piling works at Ealees Brook and works within Gale west.
- 5.12.2 A number of potential sensitive receptors have been identified that may require structural survey due to the potential for cosmetic damage and potential exceedances of vibration levels of 10mm/s. Locations predicted in the ES to exceed this level are indicated in Table A-1 in Appendix 2 for reference to this CNVMP.
- 5.12.3 Any structural surveys needed will be carried out by a suitably qualified professional and will take place before and after the works.

6.0 Noise

6.1 Noise monitoring locations

- 6.1.1 Construction activity within all areas of the scheme will generate noise, although the key noise generating activities are piling and earthworks construction.
- 6.1.2 Potential sensitive receptors where noise is anticipated to exceed noise thresholds are identified in Appendices 1A-1E.
- 6.1.3 Noise monitoring locations have been identified by the contractor and these locations can be found in Appendices 1A-1E.

6.2 Noise monitoring equipment

- 6.2.1 At each monitoring location the contractor shall position noise monitoring equipment at a distance of 1m from the façade facing the construction works. The microphone shall be at 1.5m above the ground. The noise monitoring equipment shall have a sampling rate of 1 second, or less than 1 second. The equipment shall record the LAeq (in A-frequency weighting and Fast-time weighting setting) and the LMax (in A-frequency weighting and Fast-time weighting setting).
- 6.2.2 The following noise monitoring equipment shall be used:



Area Noise Monitor

Examples of the Area Noise Monitor on site.



No power on site? No worries!

Our Monitex Power Pack is specifically designed for use with the Monitex Area Noise Monitor. In all types of weather conditions, this powerful and robust power pack will keep your noise monitoring on track.



Where mains power is unavailable, the unit can also be powered by solar panels charging the monitor through the controller. To achieve optimum performance, the panel(s) must be pointed south and mounted at a high level so no shadows, buildings or machinery shade them.* Periodic cleaning of the panel(s) is advised for best results. In very low light conditions, we cannot guarantee continuous power if only using one solar panel. Use of an additional solar panel should allow charging to continue even in very low light conditions.



Figure 6.1 – Noise monitoring equipment

- 6.2.3 The information obtained by the monitoring station sending the data to an iCloud. Data is the extracted daily and installed in a QA folder as part of the piling ITP.

6.3 Noise management – noise thresholds

- 6.3.1 BS 5228-1 states that:

“Noise levels generated by construction activities are deemed to be potentially significant if the total noise (pre construction ambient plus construction noise) exceeds the pre-construction ambient noise by 5dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq,T}$ from construction noise alone, for the daytime, evening and night-time periods respectively. This applies for a duration of one month or more, unless works for a shorter duration are likely to result in a significant effect.”

6.3.2 Based on BS 5228-1 construction noise threshold limits for residential properties are defined as follows:

- Daytime noise threshold: 65 dB $L_{Aeq,T}$ or the baseline noise level +5dB, whichever is lower
- Evening noise threshold: 55 dB $L_{Aeq,T}$ or the baseline noise level +5dB, whichever is lower
- Night-time noise threshold: 45 dB $L_{Aeq,T}$ or the baseline noise level +5dB, whichever is lower

6.3.3 BPM measures shall be implemented, as outlined in Section 5 by the contractor to control and mitigate noise effects. Where noise levels exceed those identified above, the contractor shall use enhanced mitigation measures as detailed in Section 6.4.

6.3.4 Where BPM or enhanced mitigation measures cannot sufficiently control the noise, BS 5228-1 suggests a developer should offer noise insulation or temporary rehousing to residents affected by construction works when:

“Where, in spite of the mitigation measures applied, noise levels at some properties are expected to exceed trigger levels for the periods defined below, a scheme for the installation of noise insulation or the reasonable costs thereof, or a scheme to facilitate temporary rehousing of occupants, as appropriate, should be implemented by the developer or promoter. The scheme should include provision for the notification of affected parties.

Noise insulation, or the reasonable cost thereof, should be offered by the developer or promoter to owners, where applied for by owners or occupiers, subject to meeting the other requirements of the Scheme, where the construction of the development causes or is expected to cause a measured or predicted airborne construction noise level that exceeds either of the following at property lawfully occupied as a permanent dwelling:

- *The noise insulation trigger levels (reproduced in Table 6.1) for the corresponding times of day*
- *A noise level 5dB or more above the existing preconstruction ambient noise level for the corresponding times of day.*

whichever is the higher and for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any consecutive months.”

6.3.5 In terms of temporary rehousing, where construction noise levels are such that noise insulation would not provide sufficient attenuation to prevent disturbance or interference with activities or sleep, then the occupants can be temporarily re-housed away from the construction site. The BS 5228-1 guidance advises that:

“Temporary rehousing, or the reasonable costs thereof, should be offered by the developer or promoter to owners, where applied for by owners or occupiers, subject to meeting the other requirement of the scheme, where the construction of the development causes, or is expected to cause, a measured or predicted airborne conduction noise level that exceeds either of the following at property lawfully occupied as a permanent dwelling:

- *A noise level 10 dB above any of the trigger noise levels (reproduced in Table 6.1) for the corresponding times of the day; or*
- *A noise level 10 dB above the pre-construction ambient noise level for the corresponding times of the day.*

whichever is the higher and for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months.

Non-residential buildings where the occupants of which are likely to be particularly sensitive to noise (these include commercial and educational establishments, hospitals and clinics) should be subject to individual consideration by the developer or promoter, upon application by the affected party.”

- 6.3.6 Table 6.1 presents the noise thresholds for noise insulation and temporary re-housing, in line with BS 5228-1.

Table 6.1 - Noise thresholds for noise insulation/temporary re-housing from BS 5228-1

Day	Time (hrs)	Average period (T)	Noise insulation trigger level $L_{Aeq,T}$ (dB) ^{1, 2}	Temporary rehousing trigger level $L_{Aeq,T}$ (dB) ^{1, 2}
a) Monday-Friday	07:00-08:00	1 hr	70	80
	08:00-18:00	10 hrs	75	85
	18:00-19:00	1 hr	70	80
	19:00-22:00	1 hr	65	75
b) Saturday	07:00-08:00	1 hr	70	80
	08:00-18:00	5 hrs	75	85
	18:00-19:00	1 hr	70	80
	19:00-22:00	1 hr	65	75
c) Any day	22:00-07:00	1 hr	55	65
¹ Proposed scheme construction sound only. Trigger levels are defined as 1m in front of the closest facade of a habitable room. ² Where the current ambient noise level is greater than the noise insulation trigger level: a) the ambient noise level shall be used as the noise insulation trigger level, and b) the ambient noise level +10dB shall be used as the temporary rehousing trigger level.				

- 6.3.7 The contractor shall submit a noise insulation or temporary rehousing appraisal with sufficient appropriate time prior to starting the works. It is essential that the assessment is carried out early enough so that noise insulation can be installed before the start of the works predicted to exceed noise insulation or temporary re-housing criteria.
- 6.3.8 Typically, a noise insulation package will include secondary glazing, an alternative method of ventilation and, on certain aspects, venetian blinds.

6.4 Noise management – trigger levels

- 6.4.1 In order to control the noise effects of the scheme, the following trigger levels shall be applied to the management of noise based on the thresholds and information from Section 6.3.

Table 6.2 – Trigger levels

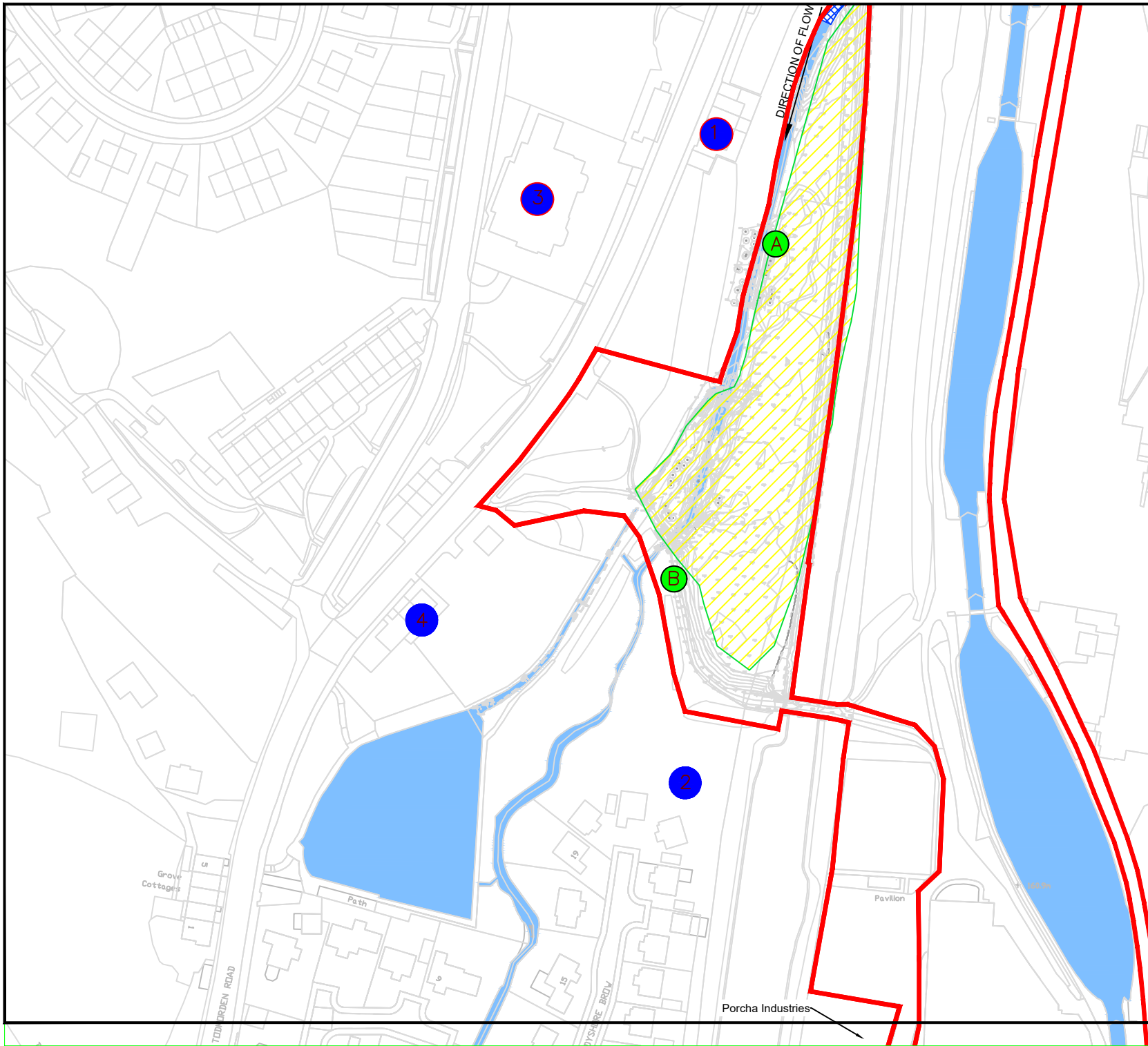
Trigger Levels	Actions
Green Below daytime noise threshold 65 dB $L_{Aeq,T}$ and below 5dB above the baseline Below evening noise threshold 55 dB $L_{Aeq,T}$ Below night-time noise threshold 45 dB $L_{Aeq,T}$	None.
Amber Above day time noise threshold 65 dB $L_{Aeq,T}$ and below 10dB above the baseline Above evening noise threshold 55 dB $L_{Aeq,T}$ Above night-time noise threshold 45 dB $L_{Aeq,T}$	Review BPM currently being used Implement enhanced mitigation measures.
Red Above day time noise threshold 65 dB $L_{Aeq,T}$ and above 10dB above the baseline Above evening noise threshold 55 dB $L_{Aeq,T}$ and above 10dB above the baseline Above night-time noise threshold 45 dB $L_{Aeq,T}$ and above 10dB above the baseline	Stop works and review primary cause of trigger. Modify the methods / techniques of work. Review and consider the need for noise insulation and/ or temporary re-housing.

6.5 Noise management – daytime noise 65 dB $L_{Aeq,T}$ and exceeds the measured baseline by +5dB

- 6.5.1 In most cases noise effects +5dB above the measured baseline shall be controlled through the use of BPM measures outlined in Section 5.
- 6.5.2 A number of receptors are anticipated to have exceedances of these thresholds, as outlined in Appendices 1A-1E.
- 6.5.3 Should the implementation of BPM not provide sufficient mitigation and noise levels continue to exceed +5dB with this mitigation in place, enhanced mitigation measures shall be implemented by the contractor.
- 6.5.4 Acoustic barriers consisting of site materials such as bricks, earth mounds or proprietary types, or acoustic barriers designed for construction sites should be installed when noise cannot be sufficiently reduced through the use of BPM such as by careful siting of noise sources (i.e. facing away from the surrounding sensitive receptors). Where screening is installed, these needs to be regularly inspected to ensure that it remains in good condition with no damage or failure of the acoustic barrier.
- 6.5.5 Where viable, the contractor shall make use of the temporary acoustic barriers or heavy-duty site hoarding around particularly noisy activities (or stationary plant such as generators), site compound areas, or areas subject to intense periods of construction activity and/or elevated construction noise levels with sensitive receptors in close proximity.

- 6.5.6 It is expected that in most of the cases construction levels within 5 to 10dB above the 65 dB $L_{Aeq,T}$ daytime threshold are likely to be successfully mitigated through the use of BPMs and through enhanced mitigation. The locations at which enhanced measures are to be implemented (i.e. acoustic barriers) will be assessed by the contractor and should consider the locations listed in Table A-2 in Appendix 2, provided for reference to this CNVMP.
- 6.6 Noise management – evening (19.00 – 23.00) noise meeting or exceeding 55 dB $L_{Aeq,t}$ or night time (23.00 – 07.00) noise meeting or exceeding 45 dB $L_{Aeq,t}$
- 6.6.1 It is anticipated that there is only one activity that will occur in the evening or night-time periods. Dewatering is required for construction activity at Gale west.
- 6.6.2 Two pumps will be required for this activity and will run continuously 24 hours 7 days a week within Gale West working site. This will be over periods of 2-3 months for the river diversions and the headwall construction. The orifice structure will be for 6+ months.. Since these are proposed to be operational alongside the construction activities during the daytime and on their own during the evening and night-time periods, enhanced mitigation shall be implemented by the contractor during all periods of the day. These measures include:
- Selecting plant with the lowest noise output levels or plant which integrates low noise emission technologies
 - Careful selection of the location of the plant, to be placed as far as possible, facing away from the sensitive receptors in the area (i.e. properties on Elim Street, Todmorden Road and Fair View)
 - Provision of an acoustic enclosure for any item of plant to be operational over a 24/7 basis.
- 6.6.3 Screening and acoustic enclosures will be utilised, as outlined in section 6.5 to minimise noise transmission off the construction site.
- 6.7 Noise management – noise insulation and temporary re-housing
- 6.7.1 As outlined in Section 6.5, further mitigation, in the form of noise insulation and potentially temporary re-housing will be required should noise levels exceed the thresholds and durations outlined.
- 6.7.2 There are a number of receptors identified where this may be required (day-time only), including 6 Rock Nook from sheet piling activity at Grove Lodge, 6 Elim Street and 20 Todmorden Road for dewatering activity at Gale west, plus 40 Elim terrace, 11 Shottwood Fold and Meridor, Lightowlers Lane. These receptors are all, based on current information likely to experience noise levels that exceed thresholds for noise insulation and/ or temporary re-housing without any enhanced mitigation.
- 6.7.3 The contractor shall monitor the noise effects and shall undertake a further noise appraisal once BPM and enhanced mitigation is in place to establish whether there will be a need for noise insulation and/ or temporary re-housing.

Appendix 1A - Grove lodge monitoring locations



Key



- 1 - 6 Rock Nook
- 2 - 22 Reddysore Brow
- 3 - Stansfield RC Primary School
- 4 - 3 Green Clough



VolkerStevin's Proposed Location Points
Noise & Vibration Monitoring Locations A&B

REV	DATE	DESCRIPTION
A	16/05/23	Noise & Vibration Monitoring Locations
REVISION		

DRAWING STATUS
ISSUED FOR PLANNING DISCHARGE
CONDITIONS



VolkerStevin Ltd.
The Lancashire Hub
Preston City Park
Bluebell Way
Preston, PR2 5PE
Telephone: 01772 708 620
Registered in England No. 288392



CLIENT

Environment Agency

PROJECT

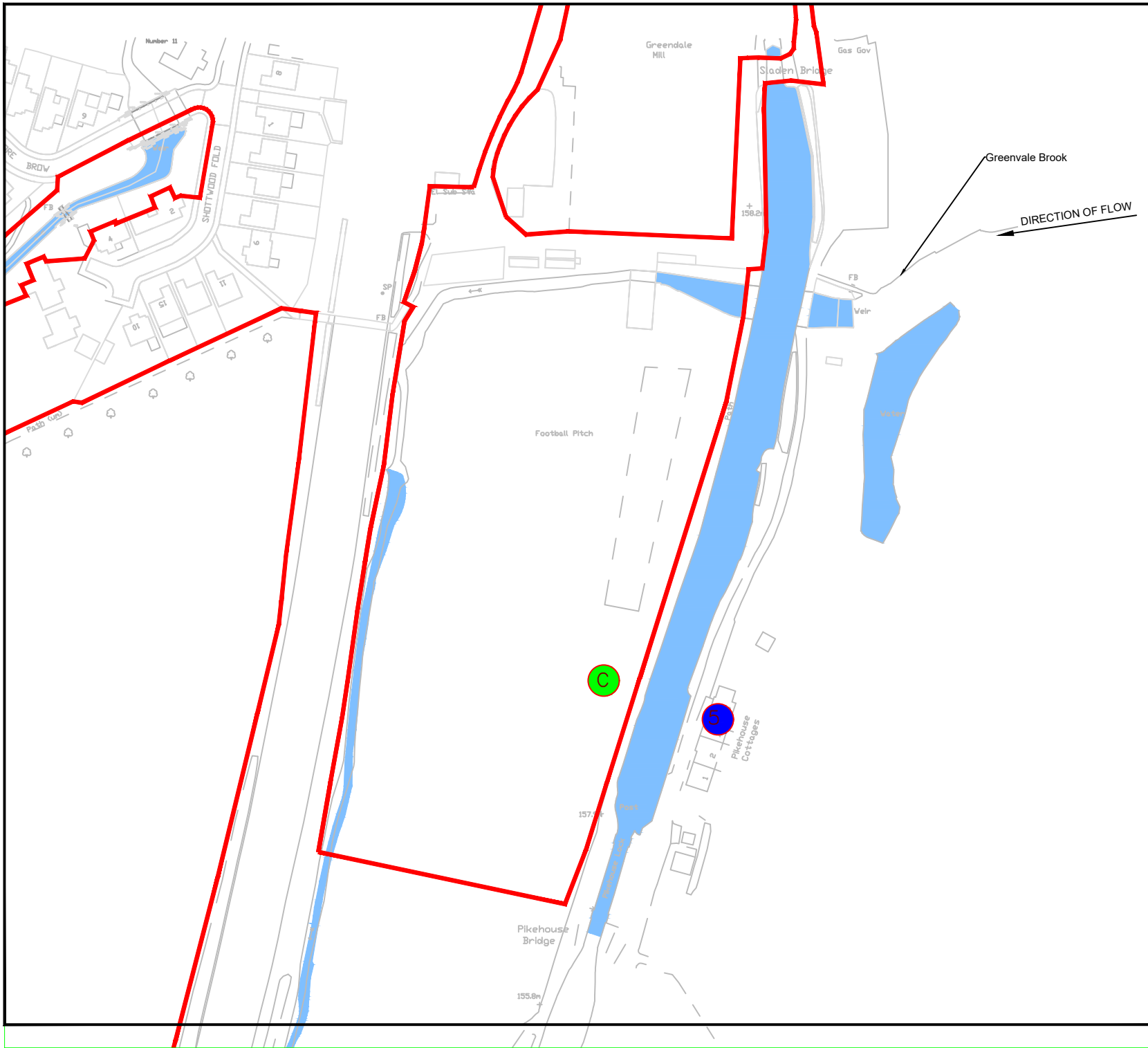
Littleborough Phase 1B

TITLE

Appendix 1A Grove Lodge Noise &
Vibration Monitoring Locations

Designed	JM	17/05/23	Scales AS SHOWN
Drawn	JM	17/05/23	Drawing No.
Checked	JM	17/05/23	C143583-JM-GL-PD1-001

Appendix 1B – Gale east monitoring locations



Key



5 - 6 Pikehouse Cottages, Lightowiers Lane



VolkerStevin's Proposed Location Points
Noise & Vibration Monitoring Locations C

REV	DATE	DESCRIPTION
A	16/05/23	Noise & Vibration Monitoring Locations
REVISION		

DRAWING STATUS
ISSUED FOR PLANNING DISCHARGE
CONDITIONS



VolkerStevin Ltd.
The Lancashire Hub
Preston City Park
Bluebell Way
Preston, PR2 5PE
Telephone: 01772 708 620
Registered in England No. 288392

CLIENT

Environment Agency

PROJECT

Littleborough Phase 1B

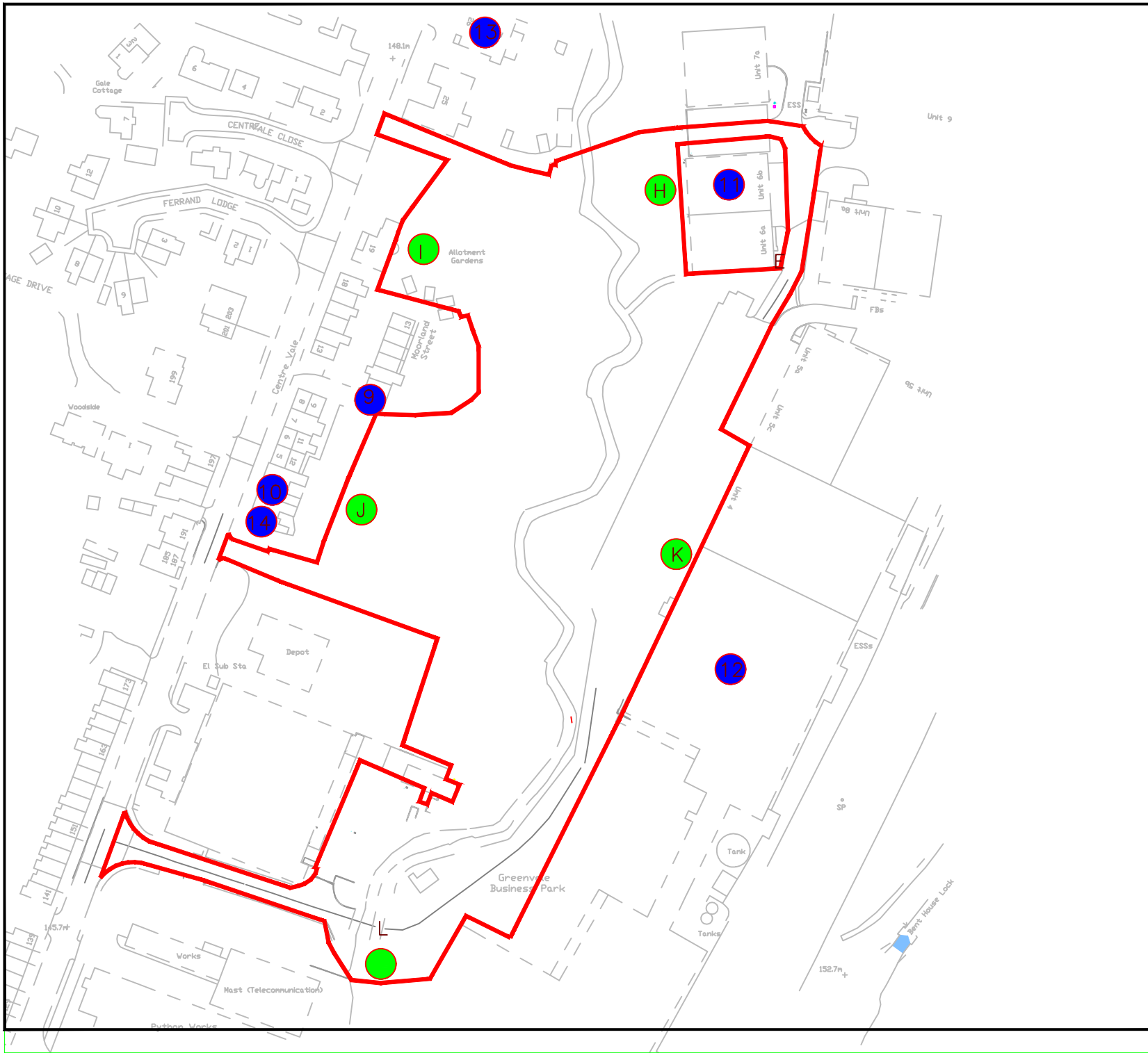
TITLE

Appendix 1B Gale East Noise &
Vibration Monitoring Locations

Designed	JM	17/05/23	Scales AS SHOWN
Drawn	JM	17/05/23	Drawing No.
Checked	JM	17/05/23	C143583-JM-GE-PD1-001

Appendix 1C – Gale west monitoring locations

Appendix 1D – Greenvale Business Park and Centre Vale monitoring locations



Key



- 9 - 1 Moorland Street
- 10 - 3 Centre Vale
- 11 - Unit 6B GVB
- 12 - Unit 3 GVB
- 13 - Jitterbugs Ltd
- 14 - 1 Centre Vale



VolkerStevin's Proposed Location Points
Noise & Vibration Monitoring
Locations H, J, K & L

A	16/05/23	Noise & Vibration Monitoring Locations
REV	DATE	DESCRIPTION
REVISION		

DRAWING STATUS
ISSUED FOR PLANNING DISCHARGE
CONDITIONS



VolkerStevin Ltd.
The Lancashire Hub
Preston City Park
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Preston, PR2 5PE
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Registered in England No. 288392

CLIENT

Environment Agency

PROJECT

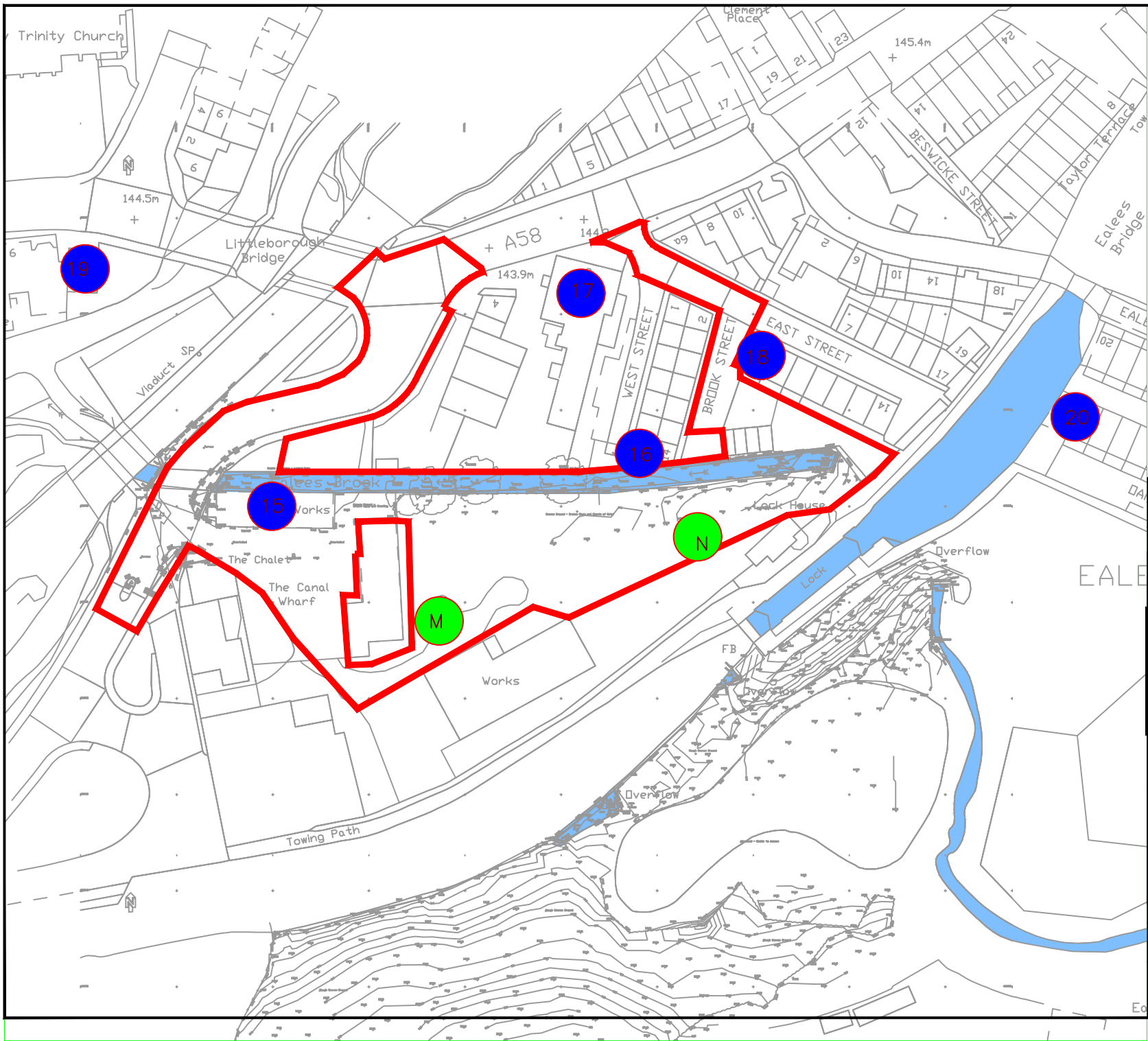
Littleborough Phase 1B

TITLE

Appendix 1D Centre Vale & GVB Noise
& Vibration Monitoring Locations

Designed	JM	17/05/23	Scales AS SHOWN
Drawn	JM	17/05/23	Drawing No.
Checked	JM	17/05/23	C143583-JM-GVB-PD1-001

Appendix 1E – Ealees Brook monitoring locations



Key

- 15 - Brookfield Garage
 - 16 - 13 West Street
 - 17 - Red Lion Hotel
 - 18 - 2 East Street
 - 19 - 5 Church Street
 - 20 - 1 Oak Street
-
- VolkerStevin's Proposed Location Points
Noise & Vibration Monitoring
Locations M & N

A	16/05/23	Noise & Vibration Monitoring Locations
REV	DATE	DESCRIPTION
REVISION		
DRAWING STATUS ISSUED FOR PLANNING DISCHARGE CONDITIONS		
 VolkerStevin Ltd. The Lancashire Hub Preston City Park Bluebell Way Preston, PR2 5PE Telephone: 01772 708 620 Registered in England No. 288392		
CLIENT Environment Agency		
PROJECT Littleborough Phase 1B		
TITLE Appendix 1E Eales Brook Noise & Vibration Monitoring Locations		
Designed	JM	17/05/23
Drawn	JM	17/05/23
Checked	JM	17/05/23
Scales AS SHOWN		Drawing No. C143583-JM-EB-PD1-001

Appendix 2 – Sensitive noise receptors

This appendix presents a summary of the locations identified in the Environmental Statement (ES) with significant noise effects when BPM or any other mitigation measures are not considered. Noise and vibration monitoring during construction is therefore recommended be undertaken at these locations or other equidistant and representative of these.

Table A-1 summarises the locations with predicted significant vibration effects in terms human annoyance and where a risk of cosmetic damage has been identified, when BPM or any other mitigation measures are not considered. Table A-1 also indicates when the predicted vibration level is likely to exceed 8mm/s and 10mm/s for which considerations are in place in this management plan.

Table A-1: Representative ES assessment locations predicted with significant vibration effects during construction

Representative ES assessment location with vibration effects	Vibration effects predicted during construction activity	Human annoyance effect? ¹	Risk of cosmetic damage? ²	Predicted above 8mm/s?	Predicted above 10mm/s?
<i>Working site: Grove Lodge</i>					
6 Rock Nook (A6033), at 30m	Vibratory Sheet piling (alongside Network Rail boundary fence)	Yes	No	No	No
22 Reddyshore Brow, at 49m	Vibratory Sheet piling (alongside Network Rail boundary fence)	Yes	No	No	No
Stansfield Hall C.E. and Free Church Primary School, at 77m	Vibratory Sheet piling (alongside Network Rail boundary fence)	Yes	No	No	No
3 Green Clough, at 109m	Vibratory Sheet piling (alongside Network Rail boundary fence)	Yes	No	No	No
<i>Working site: Gale East</i>					
6 Pikehouse Cottages, Lightowlers Lane, at 83m	Vibratory compaction (wall to the east of the Network Rail culvert)	Yes	No	No	No
<i>Working site: Gale West</i>					
8 Elim Street	Vibratory compaction (West embankment) – at 6.5m	Yes	Yes	Yes	Yes
	Vibratory piling (cofferdam installation) – at 74m	Yes	No	No	No
11 Shottwood Fold	Vibratory compaction (East embankment) – at 15m	Yes	No	Yes	Yes
	Vibratory piling (East embankment) – at 15m	Yes	No	Yes	Yes
6 Todmorden Road	Vibratory compaction (South embankment) – at 99m	Yes	No	No	No
	Vibratory piling (South of spillway platform) – at 106m	Yes	No	No	No
<i>Working site: Greenvale Business Park</i>					
1 Moorland Street, at 15m	Vibratory compaction	Yes	No	Yes	Yes
3 Centre Vale, at 20m	Vibratory compaction – at 20m	Yes	No	No	No

Representative ES assessment location with vibration effects	Vibration effects predicted during construction activity	Human annoyance effect? ¹	Risk of cosmetic damage? ²	Predicted above 8mm/s?	Predicted above 10mm/s?
Unit 6B, Greenvale Business Park, at 36m	Vibratory compaction	Yes	No	No	No
Unit 3, Greenvale Business Park, at 14m	Vibratory piling	Yes	No	Yes	Yes
Jitterbugs Ltd, Riverside Works, Todmorden Road, at 35m	Vibratory piling	Yes	No	No	No
1 Centre Vale, at 75m	Vibratory piling	Yes	No	No	No
<i>Working site: Ealees Brook (Option 1 – sheet piled wall)</i>					
Brookfield Garage, Canal Street, at 1m	Vibratory piling (along left bank of river)	Yes	Yes	Yes	Yes
13 West Street, at 6m	Vibratory piling (along left bank of river)	Yes	Yes	Yes	Yes
Red Lion Hotel, 6 Halifax Road, at 14m	Vibratory piling (along left bank of river)	Yes	No	Yes	Yes
2 East Street, at 27m	Vibratory piling (along left bank of river)	Yes	No	No	No
5 Church Street, at 65m	Vibratory piling (along left bank of river)	Yes	No	No	No
1 Oak Street, at 72m	Vibratory piling (along left bank of river)	Yes	No	No	No
¹ The ES adopted a limit of 1 mm/s to determine the potential for a human annoyance effect due to vibration.					
² The ES adopted a limit of 12.5mm/s to determine the risk of cosmetic damage to buildings due to vibration.					

Table A-2 summarises the locations with predicted significant noise effects, when BPM or any other mitigation measures are not considered. This is when the construction activities were predicted to exceed a 65 dB $L_{Aeq,daytime}$ limit (07:00-19:00) and/or exceeded the measured baseline by +5dB. Table A-2 also indicates when the predicted construction noise level is likely to exceed the threshold by more than 10dB, which may require noise insulation and/ or temporary re-housing.

Table A-2: Representative ES assessment locations predicted with significant noise effects during construction

Representative ES assessment location with noise effects	Noise effects predicted during construction activity (daytime only)	Predicted Construction noise level is +10dB above the noise threshold?
<i>Working site: Grove Lodge</i>		
6 Rock Nook (A6033)	Sheet piling alongside Network Rail boundary fence	Yes
22 Reddyshore Brow	Sheet piling alongside Network Rail boundary fence	No
2 Barnes Meadows	Sheet piling alongside Network Rail boundary fence	No
Stansfield Hall C.E. and Free Church Primary School	Sheet piling alongside Network Rail boundary fence	No
<i>Working site: Reddyshore Brow</i>		

Representative ES assessment location with noise effects	Noise effects predicted during construction activity (daytime only)	Predicted Construction noise level is +10dB above the noise threshold?
6 Shottwood Fold	Regrade slope and install Vmax and rock rolls	No
8 Shottwood Fold	Regrade slope and install Vmax and rock rolls	No
<i>Working site: Gale East</i>		
11 Shottwood Fold	Sheet piling wall to the east of the Network Rail culvert	No
<i>Working site: Gale West</i>		
8 Elim Street	West embankment works	No
6 Elim Street	Sheet piling along the south of the spillway platform	No
	Plant (i.e. pumps) for dewatering excavation works operating over 24h ¹	Yes
24 Glen View, Todmorden Road	West embankment works	No
40 Elim Terrace Todmorden Road	Sheet piling along the east embankment	Yes
18 Todmorden Road	Sheet piling along the south of the spillway platform	No
	Plant (i.e. pumps) for dewatering excavation works operating over 24h ¹	Yes
11 Shottwood Fold	East embankment works	Yes
10 Shottwood Fold	Site clearance and landscaping	No
2 Reddysore Brow	Sheet piling along the east embankment	No
Meridor, Lightowlers Lane	Sheet piling along the east embankment	Yes
3 Fair View	Plant (i.e. pumps) for dewatering excavation works operating over 24h ¹	No
<i>Working site: Greenvale Business Park</i>		
1 Moorland Street	Sheet piled wall with capping beam works	No
	Reinforced earth embankment works	No
4 Centre Vale	Sheet piled wall with capping beam works	No
7 Centre Vale	Reinforced earth embankment works	No
<i>Working site: Eales Brook (Option 1 – sheet piled wall)</i>		
Brookfield Mill, Canal Street	Sheet piling along left bank of river	Yes
	Wall backfill and copings works	No
5 Church Street	Sheet piling along left bank of river	No
Red Lion Hotel, 6 Halifax Road	Sheet piling along left bank of river	Yes
13 West Street	Sheet piling along left bank of river	Yes
14 Brook Street	Sheet piling along left bank of river	Yes
2 East Street	Sheet piling along left bank of river	Yes
1 Oak Street	Sheet piling along left bank of river	No
¹ This corresponds to an activity occurring during the evening and night-time periods. A significant noise effect has been identified when the construction activity was predicted to exceed the 55 dB L _{Aeq,evening} (19:00-23:00) and/or the 45 dB L _{Aeq,night-time} (23:00-07:00) limits.		

Appendix 3

For reference to this CNVMP this appendix contains a summary of the baseline noise survey data which has been employed in the ES to assess the potential effects from construction noise.

An attended baseline noise survey was undertaken was conducted on Wednesday 12 September 2018 and Thursday 13 September 2018 between the hours of 10:00 and 16:00, to determine existing noise levels at some of the nearest representative noise sensitive receptors to the proposed construction activities. Rochdale Borough Council has been consulted and confirmed in an email on 30 August 2018 that the proposed noise survey locations and methodology were both acceptable.

Noise monitoring was undertaken across two weekdays (outside of school holiday periods) at eight locations. Two measurements of 30 minutes were taken within the daytime period (07:00-19:00) at each location. These survey periods are considered to provide noise levels representative of typical daytime hours. All measurements were undertaken in free-field conditions.

Figure B-1 reproduces Drawing No. ENV000100-JAC-ZZ-4B0-DR-EN-1001 from the ES and shows the baseline noise monitoring locations

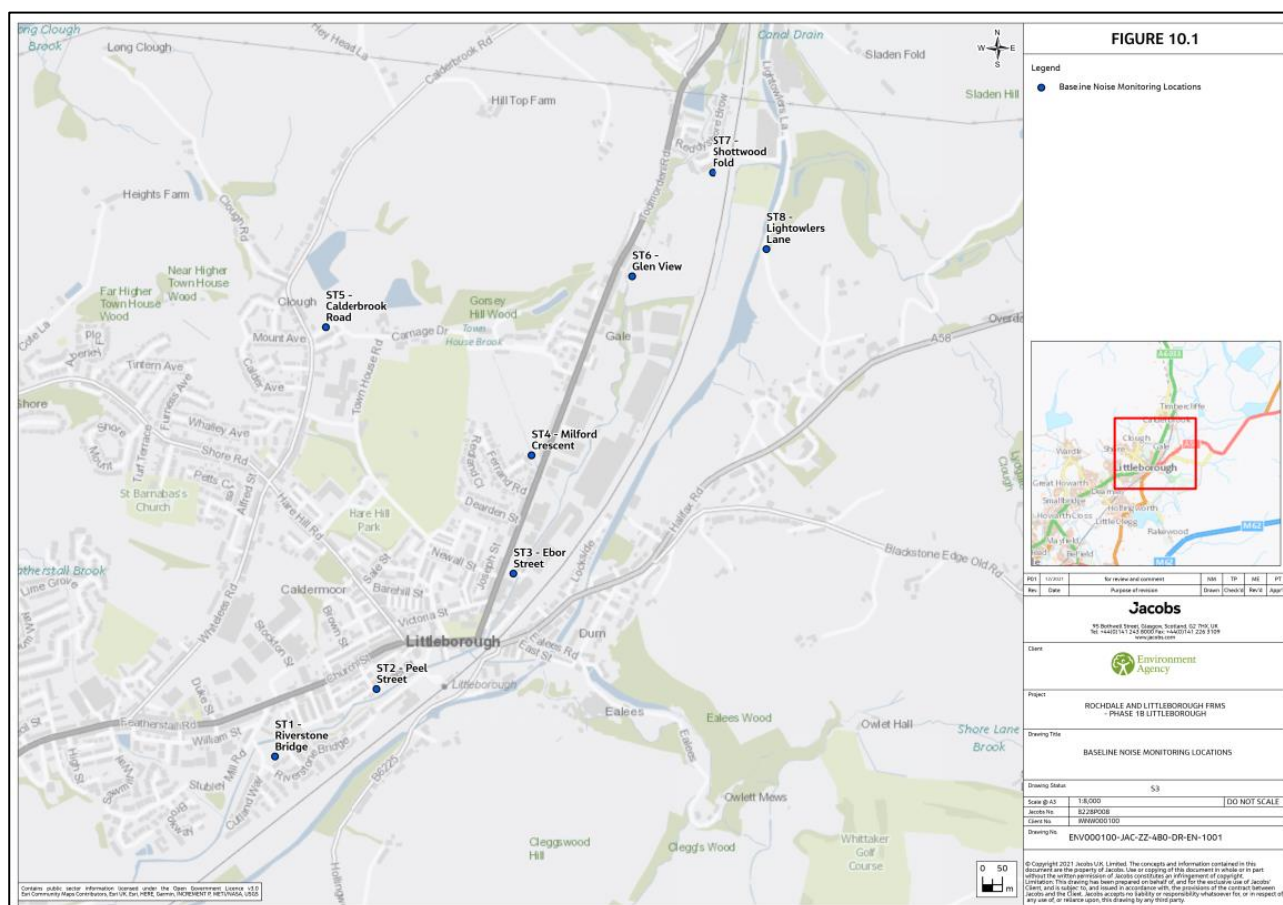


Figure B-1 Baseline noise monitoring locations from the ES

Table B-1 presents the results from the measured baseline noise levels.

Table B-1 Baseline noise survey results (free-field)

Baseline noise survey location	Date	Time Period	Measured Noise Level, dB(A)			
			L _{Aeq,T}	L _{Amax}	L _{A10}	L _{A90}
ST1 – Riverstone Bridge	13/09/18	10:30-11:00	50	67	52	46
ST1 – Riverstone Bridge	13/09/18	13:26-13:56	52	68	54	48

Baseline noise survey location	Date	Time Period	Measured Noise Level, dB(A)			
			L _{Aeq,T}	L _{Amax}	L _{A10}	L _{A90}
ST2 – Peel Street	12/09/18	09:25-09:55	55	76	54	44
ST2 – Peel Street	12/09/18	12:53-13:23	51	70	55	45
ST3 – Ebor Street	12/09/18	10:47-11:17	60	75	61	48
ST3 – Ebor Street	12/09/18	14:10-14:40	59	77	64	51
ST4 – Milford Crescent	12/09/18	10:07-10:37	54	73	57	42
ST4 – Milford Crescent	12/09/18	13:32-14:02	54	67	57	44
ST5 – Calderbrook Road	12/09/18	11:43-12:13	44	61	48	39
ST5 – Calderbrook Road	12/09/18	14:50-15:20	49	75	47	39
ST6 – Glen View	13/09/18	09:51-10:21	50	65	52	45
ST6 – Glen View	13/09/18	12:49-13:19	51	66	53	46
ST7 – Shottwood Fold	13/09/18	09:10-09:40	55	74	52	45
ST7 – Shottwood Fold	13/09/18	12:12-12:42	52	75	53	45
ST8 – Lightowlers Lane	13/09/18	08:31-09:01	56	80	56	51
ST8 – Lightowlers Lane	13/09/18	11:35-12:05	56	78	55	51

The baseline noise levels considered for the purposes of the construction noise assessment in the ES, have been taken from the lowest of the two measurements performed at each location.

The measured baseline noise levels have been considered representative of the sensitive receptor locations for the ES assessment and have been determined by the most dominant noise source (i.e. mainly road traffic) in proximity to the sensitive locations. For reference to this CNVMP **Table B-2** presents a summary of the representative baseline noise levels considered at the sensitive receptor locations, as per the ES (including the locations listed in Table A-2 and Table A-1 in Appendix 2).

Table B-2 Representative baseline noise levels at the assessment sensitive receptor locations

Representative ES assessment location	Representative baseline survey location ID ¹	Baseline noise level (dB) ¹
<i>Working site: Grove Lodge</i>		
Properties on Rock Nook (A6033)	ST6	50
Properties on Lightowlers Lane	ST8	56
Properties on Reddyshore Brow	ST6	50
Properties and Stansfield Hall C.E. and Free Church Primary School on Barnes Meadows	ST6	50
<i>Working site: Reddyshore Brow</i>		
Properties on Shottwood Fold	ST7	52
Properties on Reddyshore Brow	ST6	50
<i>Working site: Gale East</i>		
Properties on Lightowlers Lane	ST8	56
Properties on Shottwood Fold	ST7	52
Properties on Halifax Road (A58)	ST8	56
Properties on Todmorden Road (A6033)	ST6	50
Properties on Fair View	ST6	50
<i>Working site: Gale West</i>		

Representative ES assessment location	Representative baseline survey location ID ¹	Baseline noise level (dB) ¹
Properties on Elim Street	ST6	50
Properties on Todmorden Road (A6033)	ST6	50
Properties on Fair View	ST6	50
Properties on Shottwood Fold	ST7	52
Properties on Reddyshore Brow	ST7	52
Properties on Lightowlers Lane	ST8	56
<i>Working site: Greenvale Business Park</i>		
Properties on Moorland Street	ST6	50
Properties on Centre Vale	ST6	50
Properties on Todmorden Road (A6033)	ST4	54
<i>Working site: Ealees Brook</i>		
Properties on Canal Street	ST2	51
Properties on Church Street	ST2	51
Properties and Hotel on Halifax Road	ST2	51
Properties on West Street	ST2	51
Properties on Brook Street	ST2	51
Properties on East Street	ST2	51
Properties on Oak Street	ST2	51
Properties on Ealees Road	ST2	51
¹ Location ID and baseline noise level from Table B-1.		